



# Full wwPDB NMR Structure Validation Report ⓘ

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PDB ID : 1WUG  
Title : complex structure of PCAF bromodomain with small chemical ligand NP1  
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Deposited on : 2004-12-07

This is a Full wwPDB NMR Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/NMRValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

Cyrange : Kirchner and Güntert (2011)  
NmrClust : Kelley et al. (1996)  
MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
RCI : v\_1n\_11\_5\_13\_A (Berjanski et al., 2005)  
PANAV : Wang et al. (2010)  
ShiftChecker : 2.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

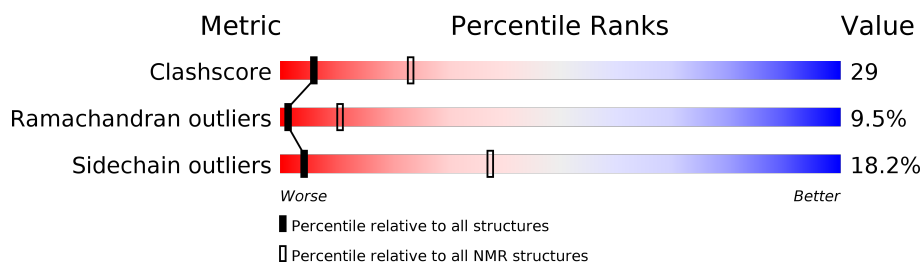
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*SOLUTION NMR*

The overall completeness of chemical shifts assignment was not calculated.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	NMR archive (#Entries)
Clashscore	158937	12864
Ramachandran outliers	154571	11451
Sidechain outliers	154315	11428

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and a grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	118	

## 2 Ensemble composition and analysis

This entry contains 1 models. Identification of well-defined residues and clustering analysis are not possible.

### 3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 2004 atoms, of which 1002 are hydrogens and 0 are deuteriums.

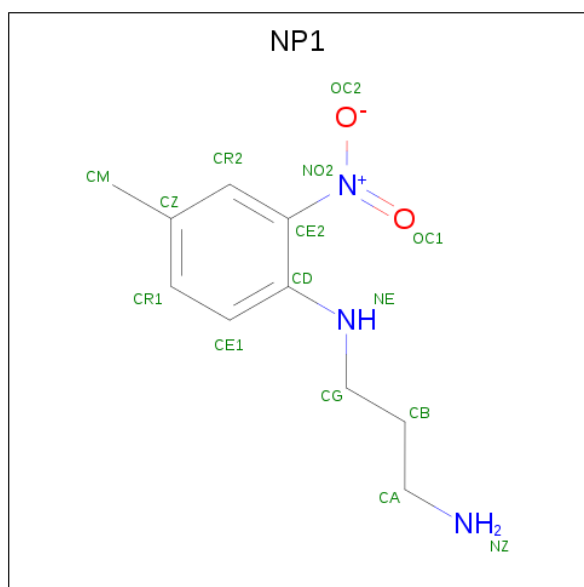
- Molecule 1 is a protein called Histone acetyltransferase PCAF.

Mol	Chain	Residues	Atoms					Trace	
			Total	C	H	N	O		S
1	A	118	1974	636	987	164	180	7	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	715	GLY	-	EXPRESSION TAG	UNP Q92831
A	716	SER	-	EXPRESSION TAG	UNP Q92831
A	717	HIS	-	EXPRESSION TAG	UNP Q92831
A	718	MET	-	EXPRESSION TAG	UNP Q92831
A	804	PRO	ALA	CONFLICT	UNP Q92831
A	805	PRO	ALA	CONFLICT	UNP Q92831

- Molecule 2 is N-(3-AMINOPROPYL)-4-METHYL-2-NITROBENZENAMINE (three-letter code: NP1) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>3</sub>O<sub>2</sub>).

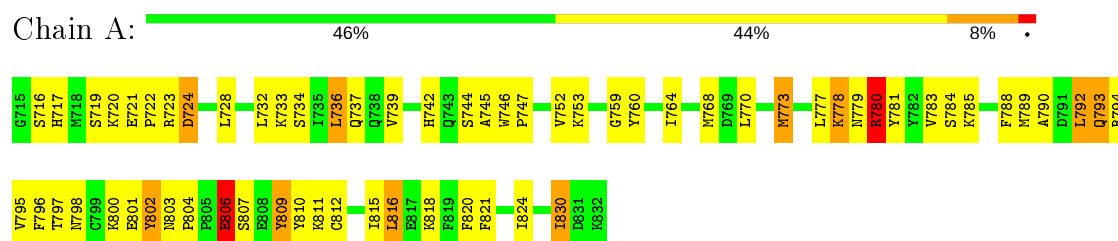


Mol	Chain	Residues	Atoms				
			Total	C	H	N	O
2	A	1	30	10	15	3	2

## 4 Residue-property plots [i](#)

These plots are provided for all protein, RNA and DNA chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

- Molecule 1: Histone acetyltransferase PCAF



## 5 Refinement protocol and experimental data overview

The models were refined using the following method: *DISTANCE GEOMETRY, SIMULATED ANNEALING*.

Of the 200 calculated structures, 1 were deposited, based on the following criterion: *structures with the least restraint violations*.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
X-PLOR	refinement	3.851

No chemical shift data was provided. No validations of the models with respect to experimental NMR restraints is performed at this time.

## 6 Model quality i

### 6.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: NP1

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 6.2 Too-close contacts i

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in each chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	987	987	984	58
2	A	15	15	15	6
All	All	1002	1002	999	59

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 29.

All clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:739:VAL:HG13	1:A:816:LEU:HD21	0.90	1.43
1:A:744:SER:O	1:A:816:LEU:HD12	0.80	1.77
1:A:739:VAL:HG13	1:A:816:LEU:CD2	0.79	2.06
1:A:764:ILE:HD11	1:A:801:GLU:HB3	0.69	1.63
1:A:736:LEU:HD13	1:A:736:LEU:O	0.67	1.89
1:A:812:CYS:HA	1:A:815:ILE:HD12	0.59	1.73
1:A:809:TYR:CE1	2:A:201:NP1:NO2	0.59	2.71
1:A:792:LEU:HD13	1:A:820:PHE:CE1	0.58	2.33
1:A:746:TRP:N	1:A:747:PRO:CD	0.58	2.67
1:A:809:TYR:CE1	2:A:201:NP1:OC2	0.56	2.58
1:A:809:TYR:CD1	2:A:201:NP1:OC2	0.55	2.59
1:A:752:VAL:HG13	2:A:201:NP1:CR1	0.55	2.31

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:793:GLN:O	1:A:797:THR:HG22	0.54	2.03
1:A:739:VAL:O	1:A:745:ALA:HB2	0.53	2.03
1:A:732:LEU:HD22	1:A:788:PHE:CG	0.53	2.39
1:A:800:LYS:CG	1:A:810:TYR:CE2	0.52	2.93
2:A:201:NP1:OC1	2:A:201:NP1:NE	0.51	2.43
1:A:800:LYS:CG	1:A:810:TYR:CD2	0.51	2.93
1:A:792:LEU:CD2	1:A:796:PHE:CZ	0.50	2.94
1:A:736:LEU:HD21	1:A:770:LEU:CD2	0.50	2.36
1:A:797:THR:HG23	1:A:798:ASN:N	0.48	2.24
1:A:778:LYS:CE	1:A:778:LYS:CA	0.46	2.92
1:A:764:ILE:HG21	1:A:798:ASN:ND2	0.46	2.25
1:A:746:TRP:CG	1:A:747:PRO:HD3	0.46	2.46
1:A:783:VAL:O	1:A:783:VAL:HG22	0.46	2.11
1:A:802:TYR:CD1	1:A:802:TYR:C	0.46	2.89
1:A:746:TRP:CE3	1:A:747:PRO:N	0.46	2.84
1:A:764:ILE:HD11	1:A:801:GLU:CB	0.46	2.38
1:A:824:ILE:HD12	1:A:830:ILE:HG12	0.45	1.86
1:A:773:MET:SD	1:A:788:PHE:CE1	0.45	3.10
1:A:747:PRO:HB3	1:A:809:TYR:CE1	0.45	2.47
1:A:800:LYS:HG2	1:A:810:TYR:CD2	0.44	2.47
1:A:736:LEU:C	1:A:736:LEU:HD13	0.44	2.32
1:A:802:TYR:CG	1:A:803:ASN:N	0.44	2.85
1:A:793:GLN:OE1	1:A:821:PHE:CZ	0.44	2.70
1:A:780:ARG:O	1:A:780:ARG:CD	0.43	2.66
1:A:792:LEU:HD23	1:A:796:PHE:CZ	0.43	2.48
1:A:722:PRO:O	1:A:724:ASP:N	0.43	2.52
1:A:746:TRP:N	1:A:747:PRO:HD3	0.43	2.27
1:A:778:LYS:CE	1:A:778:LYS:O	0.43	2.67
1:A:810:TYR:CD1	1:A:810:TYR:C	0.43	2.92
1:A:794:ARG:O	1:A:798:ASN:CB	0.43	2.67
1:A:804:PRO:O	1:A:806:GLU:N	0.42	2.52
1:A:790:ALA:O	1:A:794:ARG:N	0.42	2.53
1:A:779:ASN:O	1:A:781:TYR:N	0.42	2.53
1:A:739:VAL:O	1:A:745:ALA:CB	0.42	2.67
1:A:760:TYR:OH	1:A:798:ASN:ND2	0.42	2.53
1:A:788:PHE:CE2	1:A:792:LEU:HD12	0.42	2.49
1:A:719:SER:O	1:A:721:GLU:N	0.41	2.53
1:A:802:TYR:CE2	1:A:809:TYR:CD2	0.41	3.08
1:A:752:VAL:HG22	2:A:201:NP1:HB2	0.41	1.91
1:A:746:TRP:CD2	1:A:747:PRO:CD	0.41	3.03
1:A:783:VAL:HG13	1:A:783:VAL:O	0.41	2.16
1:A:768:MET:O	1:A:795:VAL:HG22	0.41	2.16

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:728:LEU:HG	1:A:732:LEU:CD1	0.40	2.47
1:A:773:MET:HE3	1:A:792:LEU:HD12	0.40	1.92
1:A:797:THR:CG2	1:A:798:ASN:N	0.40	2.84
1:A:728:LEU:HD23	1:A:783:VAL:HA	0.40	1.92
1:A:796:PHE:CE1	1:A:816:LEU:HB3	0.40	2.52

## 6.3 Torsion angles [i](#)

### 6.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all NMR entries. The Analysed column shows the number of residues for which the backbone conformation was analysed and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	116/118 (98%)	92 (79%)	13 (11%)	11 (9%)	<b>1</b> <b>11</b>
All	All	116/118 (98%)	92 (79%)	13 (11%)	11 (9%)	<b>1</b> <b>11</b>

All 11 Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	811	LYS
1	A	720	LYS
1	A	780	ARG
1	A	723	ARG
1	A	785	LYS
1	A	742	HIS
1	A	773	MET
1	A	759	GLY
1	A	806	GLU
1	A	830	ILE
1	A	717	HIS

### 6.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all NMR entries. The Analysed column shows the number of residues for which the sidechain conformation was analysed and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	110/110 (100%)	90 (82%)	20 (18%)	4	37
All	All	110/110 (100%)	90 (82%)	20 (18%)	4	37

All 20 residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	802	TYR
1	A	734	SER
1	A	777	LEU
1	A	736	LEU
1	A	809	TYR
1	A	737	GLN
1	A	784	SER
1	A	816	LEU
1	A	778	LYS
1	A	792	LEU
1	A	789	MET
1	A	806	GLU
1	A	780	ARG
1	A	733	LYS
1	A	753	LYS
1	A	818	LYS
1	A	724	ASP
1	A	793	GLN
1	A	807	SER
1	A	716	SER

### 6.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 6.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

LIGAND-GEOMETRY INFOmissingINFO

## 6.6 Other polymers [i](#)

There are no such molecules in this entry.

## 6.7 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 7 Chemical shift validation

No chemical shift data were provided